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PARKING PROGRAMS FOR UNIVERSITIES.

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PARKING FACILITIES WERE SURVEYED AT 83 REPRESENTATIVE UNIVERSITIES AND COLLEGES, AND THE METHODS USED IN ADMINISTERING, CONTROLLING AND FINANCING WERE EVALUTED. GENERAL RECOMMENDATIONS WERE MADE CONCERNING (1) THE LOCATION AND DESIGN OF PARKING LOTS AND GARAGES, (2) THE PRACTICE OF CURB PARKING ON CAMPUS, AND (3) THE FINANCING OF PARKING FACILITIES. THE STUDY CONCLUDES THAT PUBLIC AND PRIVATE AGENCIES ALLOCATING FUNDS TO UNIVERSITIES MUST ACCEPT THE FACT THAT OFF-STREET PARKING FACILITIES WILL HAVE TO BE PROVIDED AS AN INTEGRAL PART OF A MODERN EDUCATIONAL INSTITUTION. THE QUESTIONNAIRE FORM, DATA AND STATISTICAL RESULTS ARE INCLUDED IN THE APPENDIX. (BH)

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PARKING PROGRAMS FOR UNIVERSITIES

BASED ON OBSERVATIONS AT
WESTERN CONFERENCE UNIVERSITIES
AND THE UNIVERSITY OF CHICAGO...
WITH SURVEY DATA FROM OTHER
LARGE UNIVERSITIES

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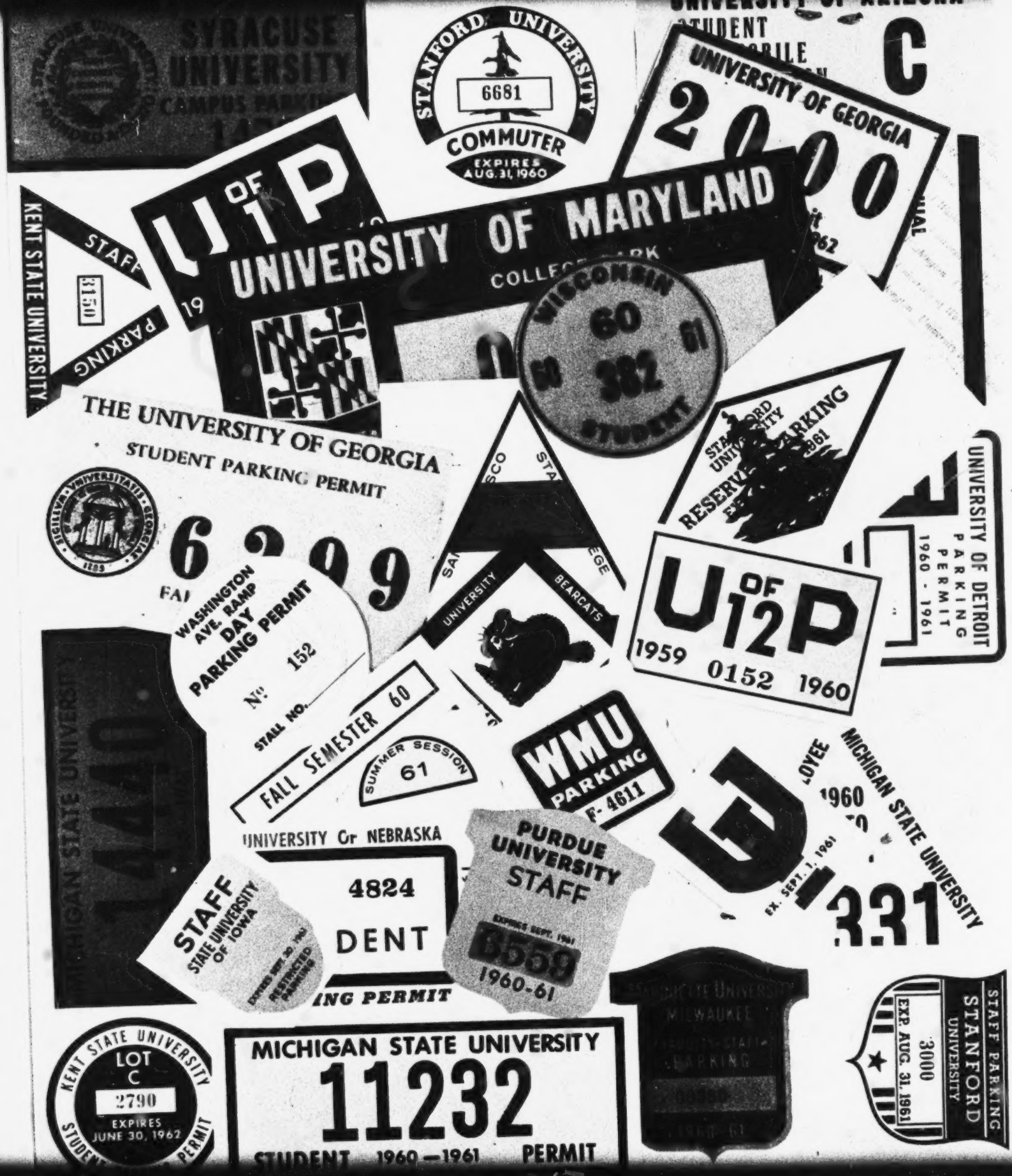

Contents

The Case ---------- 2
Purpose of the Report
Characteristics of the University -- 3
Curb Parking ---------- 8
Off-Street Parking ---------- 8
- Parking Lots
- Parking Garages
- Cost of Off-Street Parking

Site Selection Criteria ---------- 13
Financing ---------- 17
Summary of Report ---------- 18
Appendix—Questionnaire ------ 19

Exhibits
- 1—Campus Population ------- 22
- 2—Characteristics of the University ---------- 23
- 3—Public Transportation and Curb Parking ---------- 24
- 4—Existing Parking Facilities 25
- 5—Economic Aspects of Campus Parking ---------- 26

Acknowledgements; Source Material 27
Committee on Institutional Cooperation ---------- 28
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The Background

Unprecedented enrollment increases in American colleges and universities are with us and ahead of us. These same institutions are greatly expanding their activities in the fields of research and service to the public. All of this adds up to the creation of a need for new building facilities in a magnitude never before experienced.

The University Facilities Research Center has recently completed a building survey while studying immediate needs for instructional, research, operating and housing construction at the large middlewestern universities comprising the Council of Ten and the University of Chicago. This survey covered the period from the end of World War II through the ten years forward planning time adopted by the eleven universities. It indicated that approximately $1.85 billions in construction could be expected between 1946 and 1970. Of this about $1.1 billion in construction, or 60%, is now being planned or built or projected for the near future. On a national scale, this would indicate college and university building programs amounting to something in the order of $15 billion between now and the end of this decade.

Among the objectives of the Research Center is the isolation of planning and design criteria problems, followed by the finding or developing of measures for design—all to the end of permitting the best possible use of the university and college construction dollar. Analysis of statistics and interviews and conferences with interested people in the field have contributed to the selection of several monograph subjects, of which this publication is one.

The material is aimed at aiding university and college administrators and their planning and building committee people. It is also directed at private architect and engineer firms engaged in the design and execution of new facilities.

Parking Programs for Universities was selected as a subject for study in recognition of the importance of the automobile on the modern university campus scene. Parking provisions and parking control for towns and cities have come to a fairly uniform pattern through evolution. The patterns at the universities are somewhat less clear, although all university administrators agree that provisions for parking and traffic control present severe problems, and that the automobile is having a profound effect on the university campus and its building complexes.

To survey present parking practices on university and college campuses, and to derive planning and policy criteria in this field, The Research Center engaged the services of DeLeuw, Cather and Company, Engineers of Chicago. This firm has had long and varied experience with automobile parking and traffic; it was selected because of this background.

The body of this monograph, its findings and its recommendations are very largely the work of the Consultants.

W S Kinnear Jr.

Madison, Wisconsin, November, 1961

Director, University Facilities Research Center

PARKING PROGRAMS FOR UNIVERSITIES

Based on Observations at

WESTERN CONFERENCE UNIVERSITIES AND THE UNIVERSITY OF CHICAGO

Increased ownership and use of automobiles since the end of World War II has created parking problems in almost every city in the United States. Colleges and Universities, particularly in medium-to-large cities, have shared these problems. The possible remedies available to academic institutions vary with conditions, but a report of what some schools have accomplished, and how, should be helpful and encouraging to all the others.

The size of student bodies, faculties and non-teaching staffs has increased rapidly in the past fifteen years. The automobile has had even more impact on the university campus, however, than on the central business districts of cities. Whereas use of automobiles by university faculty and staff has probably grown about in the same proportion as with other types of employed persons, student reliance on the automobile has swept far beyond the predictions of pre-war campus planners. On many campuses, more than one-half of the students now own or have the use of automobiles. This fact can be attributed in part to the growing number ofstudents taking post-graduate work and in part to the large number of married students. The most important factors, however, are probably those relating to changing social and economic conditions. The automobile is no longer considered a luxury by many students, but a necessary means of transportation. Many used the auto for commuting trips to high school even before entering college.

While each university has a character of its own, many problems posed by the automobile are surprisingly similar from campus to campus. Planners are disturbed over conversion of green lawns to parking lots as well as by the general clutter caused on campus roadways. Neighbors are agitated over university-associated cars parked in front of their homes. Faculty and staff sometimes look upon availability of convenient parking space as a fringe benefit in considering a job offer. Students object to parking fees but persist in in driving to class. An important problem is to accommodate the cars of visiting lecturers and industrial clients of the schools' research facilities. Another growing activity which attracts large numbers of car-driving visitors is the sponsorship of two-day to two-week seminars on a great variety of subjects.

PURPOSE OF THE REPORT

The University Facilities Research Center recognized the seriousness of campus parking problems and responded to the interest shown by university administrators in arriving at a satisfactory solution. It was decided to survey and evaluate parking programs on campuses of West-

ern Conference Universities and the University of Chicago. This small group of universities not only includes some of the largest in the country but it also covers schools with widely varying characteristics. Campuses located in large metropolitan areas are represented as well as some in small-town settings. Some are supported or assisted by state funds while others are privately endowed. Each differs in the ratio of students living on the campus to those commuting to and from classes.

As the study progressed it was decided to expand the scope to include a general survey of other representative universities and colleges throughout the country. Questionnaires were sent, therefore, to a number of additional universities where 1960 enrollment exceeded 7,500 students. Of these, 38 returned completed questionnaires which were useful in further analysis of the campus parking problem.

It was recognized almost from the start that criteria could not be developed which could reasonably be used to determine the number and type of parking spaces required on a given campus. The study was an evaluation, instead, of progress to date and the methods of administering, controlling and financing parking facilities on each of the campuses surveyed. Specific attention was given to problems which appeared to be common from university to university as well as to apparently successful innovations which have been adopted on certain campuses.

CHARACTERISTICS OF THE UNIVERSITY AND THEIR RELATION TO PARKING

The Western Conference Universities and the University of Chicago include a selection of the largest universities in the country with widely varying characteristics. One of the most important factors related to travel habits and parking is the relationship between the size of the university and the population of the city or metropolitan area in which it is located. The following table shows total university population (students, faculty and non-teaching staff) expressed as a percentage of the population of the city or cities in which university is located.

The table shows that the universities included in the Western Conference, together with the University of Chicago, represent a wide range in regard to the size of the cities in which they are located. Expressed in terms of university population as a percentage of the population of the city, they extend from the University of Chicago, where campus population amounts to only 0.4 percent of that of the city, to Indiana University, where campus population is 56.2 percent of the population of Bloomington.

TABLE 1—RELATION OF CAMPUS POPULATION TO THAT OF CITY IN WHICH EACH UNIVERSITY IS LOCATED

University	Location	Total Campus Population* (1960–1961)	Population of Cities in Which University Is Located (1960)	Campus Population as a Percentage of Population of Cities
University of Chicago	Chicago, Illinois	13,545	3,550,404	0.4
University of Minnesota	Minneapolis–St. Paul, Minnesota	34,168	796,283	4.3
Ohio State University	Columbus, Ohio	23,813	471,316	5.1
Northwestern University	Evanston, Illinois	10,603	79,283	13.4
Michigan State University	Lansing–East Lansing, Michigan	26,278	138,005	19.0
University of Wisconsin	Madison, Wisconsin	24,129	126,706	19.0
Purdue University	Lafayette–West Lafayette, Indiana	20,195	55,010	36.7
University of Illinois	Champaign–Urbana, Illinois	28,438	76,877	37.0
State University of Iowa	Iowa City, Iowa	14,223	33,443	42.5
University of Michigan	Ann Arbor, Michigan	33,529	67,340	49.8
Indiana University	Bloomington, Indiana	17,623	31,357	56.2

* Includes all students, faculty, staff and other employees working on campus. Some commute from nearby residence locations daily.

Although other characteristics of the universities do not correspond empirically with respect to locational characteristics, some trends in make-up of the student body and administration of campus parking programs are significant. Of particular importance are variations in percentages of part-time students to total enrollment. It is also well to note the proportion of students who live in university housing as compared with students living at home. Use of mass transportation for journeys to and from the campus is also generally greater at big-city universities than at those in other locations.

At most universities in small cities or "university towns," a large proportion of students live close to the campus and few are enrolled part-time or as evening students. It has been possible for these institutions, therefore, to adopt and enforce stringent regulations regarding student driving and parking. The opposite is true at big-city universities, with all shades of graduation between the two student extremes. The table on this page summarizes regulations presently in force at Western Conference Universities and the University of Chicago.

TABLE 2
RESTRICTIONS ON USE AND PARKING OF CARS AT UNIVERSITIES STUDIED

University	Campus Population as a Percent of Population of City	Limitation on Vehicle Operation
University of Chicago	0.4	No restrictions.
University of Minnesota	4.3	No restrictions.
Ohio State University	5.1	No restrictions.
Northwestern University	13.4	Freshman residents may not operate or park a car on campus.
Michigan State University	19.0	Freshman and first term short course students may not operate or park an automobile unless they are married, 21 years old, reside off campus, or are paralytic.
University of Wisconsin	19.0	Students prohibited from driving on campus from 7 A.M. to 5 P.M. Monday through Friday and 7 A.M. to 12 Noon on Saturday. Students not allowed to park on campus.
Purdue University	36.7	Freshman and sophomore students not allowed to operate or park a car on campus.
University of Illinois	37.0	Undergraduate students may not park on campus during week days from 1 A.M. to 6 P.M.
State University of Iowa	42.5	No restrictions.
University of Michigan	49.8	Only students over 21 years old or with special permission may operate or park an automobile on campus.
Indiana University	56.2	Freshman or students on probation may not have a car except as permission is granted through the Dean of Students.

The range in attitude toward student driving and parking from the most urban to the least urban of the universities is evident. Prohibition of student driving and parking on the campus is, of course, the easiest method of solving the traffic and parking dilemma now faced by many universities. Such action, however, could impose severe hardship on part-time and local resident students at big-city universities. Many such students work before or after classes, relying on the automobile to meet both class and job schedules. For example, a survey at the Navy Pier (Chicago) campus of the University of Illinois in May 1956 showed that 57 percent of the students held part-time jobs.

The student parking problems faced by university administrators can be separated, therefore, into two distinct categories—those in urban universities resulting from large numbers of part-time and local resident students living some distance from the campus; and those in small-town universities where a great proportion of the enrollment lives within walking distance of the campus. This is an over-simplification, perhaps,

but the distinction is readily discernable when evaluating present parking programs.

The campus population includes not only students but also a large number of faculty, staff, related employees and visitors for whom parking space must be provided. The accompanying chart shows the composite makeup of the present campus population at Western Conference Universities and the University of Chicago. Students account for less that three-quarters of the total. It was concluded from the study that adequate parking space for faculty, staff, employees and visitors should be considered a necessity rather than a luxury. This view has been expressed previously by Dean Emeritus Wells Bennett of the College of Architecture and Design at the University of Michigan. In a 1956 article entitled "University Campus Parking," Dean Bennett made the following observation:

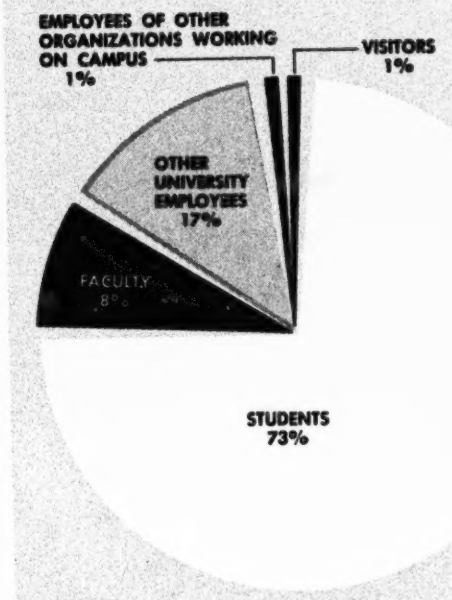
> "Positive organization of campus traffic and parking is essential to procurement and maintenance of personnel and the maintenance of operational efficiency. It can no longer be hinted to employees that the personal car is a luxury."

Parking space for students living in university housing or within easy walking distance of the campus, while desirable, should be subordinated to the requirements for faculty, staff and visitors. While all universities share equally the problem of providing parking space for the latter, the demands for student parking space are greater at the more urban universities. Unfortunately, these are often surrounded by built-up commercial and residential areas with little room for expansion of parking facilities.

Consideration must be given not only to the normal parking requirements of students, faculty and staff, but attention must also be directed towards the needs of the ever increasing number of specialists and visitors on the campus. University hospitals draw upon the services of physicians whose practices are located off-campus and whose rapid movement between office and hospital must be assured. Similarly, visitors to a university hospital must be accommodated in campus parking facilities. Other visitors not directly related to university activities–but connected in various capacities with research facilities located within the university – expect to find suitable parking arrangements during visits to the campus for conferences, seminars and other assignments of short duration.

The problems associated with accommodating motorists at such special attractions as concerts, conclaves and athletic events were not specifically included in this study. It was noted, however, that most universities have found it both physically and economically impossible to provide adequate parking space in close proximity to their mammoth stadia. In some instances, however, university parking facilities are used both for special attractions and to meet more consistant demands. At The Ohio State University, for example, stadium parking facilities are made more warrantable by using them to some extent during the week for storage of student-owned vehicles.

One of the most perplexing problems related to parking which concerns university administrators is that of university-affiliated cars parked in front of neighboring residences. Of the eleven universities studied, over one-half reported complaints by neighbors due to student or staff vehicles parked in front of their homes. There appears to



The Campus Population Composite for the Western Conference and the University of Chicago.

be no easy solution of this problem at most schools.

Northwestern University has received so many complaints that a rigorously enforced parking ban has been placed on streets adjacent to the campus. University security officials check license plates of even out-of-state vehicles to determine whether or not the cars are university-affiliated.

The consultants conclude that it is a university obligation either to fully control the use of automobiles by students or to provide adequate parking space for student cars. This is not to say that such space need be adjacent to or even close to the university buildings, nor that it should be provided free of charge. It should be the policy, however, to provide in some location—possibly on the fringe of the campus or in an outlying area—sufficient parking space to remove student-owned vehicles from both campus and neighboring streets.

CURB PARKING ON THE CAMPUS

Most universities exercise control over streets running through the campus. It is not unusual, therefore, that use of curb parking space has received a great amount of consideration from campus planners and university administrators. The variations in present curb parking regulations and restrictions have resulted mostly, however, from local necessities rather than from differences in attitude.

Planners agree that, from the viewpoint of esthetics, curb parking on the campus is undesirable. Large capital expenditures involved in beautifying the campus and constructing buildings which reflect the academic environment can often be nullified by the unsightly and mundane appearance of streets clogged with cars.

An even more important argument in favor of eliminating curb parking is that related to pedestrian safety. Cars parked at the curb obscure from the driver's view pedestrians crossing or about to cross the street. While accident records have been generally good on university campuses, this additional precaution is certainly warranted in view of the large volume of pedestrian traffic generally present.

The University of Minnesota, through an aggressive and realistic policy of providing off-street parking space, has been able to prohibit curb-parking throughout the campus. The difference such prohibition has made in the appearance of the campus is shown vividly in the series of before-and-after pictures. See Photographs No. 1 and 2. (On facing page)

At the other extreme, the University of Chicago—which has no control over parking on city streets dissecting the campus—is confronted with a continuous clutter of automobiles in unpleasant contrast to the Gothic architecture of the campus. See Photo No. 3.

Between the two extremes, numerous steps have been taken with respect to regulation or prohibition of curb parking. At the University of Wisconsin, for example, most curb parking has been prohibited except in various areas where staff parking is permitted. See Photo No. 4. A fee of $36.00 per year is charged for parking at the curb in these areas, as well as in off-street improved lots. (Note the contrast between Photos Nos. 3 and 4 and Photo No. 5, which was taken at the University of Minnesota.) Ohio State University also utilizes many curb parking spaces on the campus for faculty and staff parking. Other curb spaces are metered for use by visitors.

Before

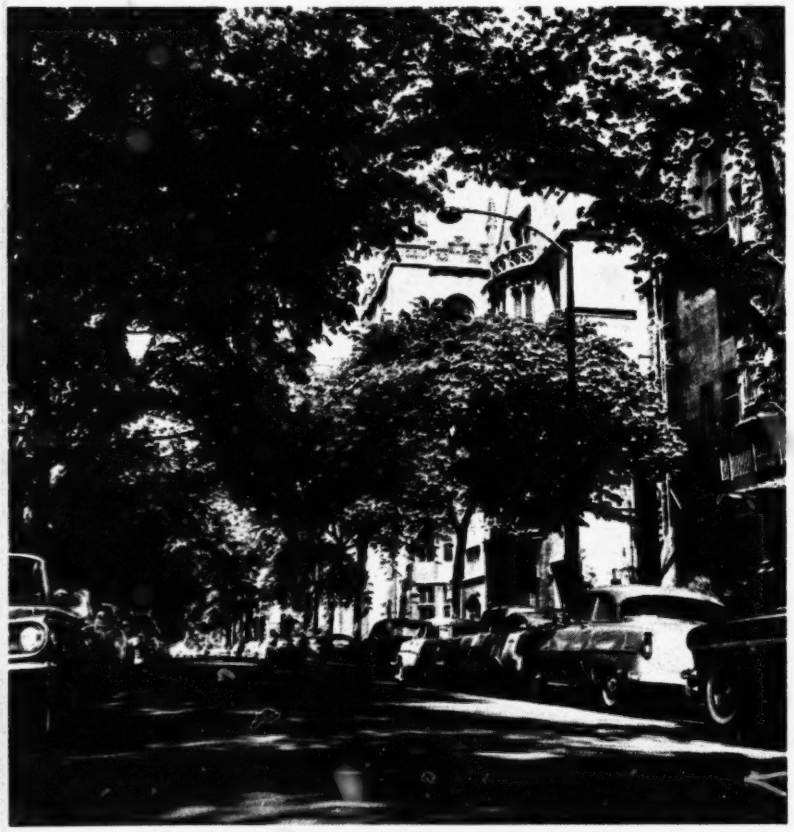
After

Photographs No. 1—This is alongside of Comstock Hall at the rear of the Union, and the street is only 30 feet wide. Cars are parked over the curb and on the sidewalk creating an extreme driving and walking hazard.

Before

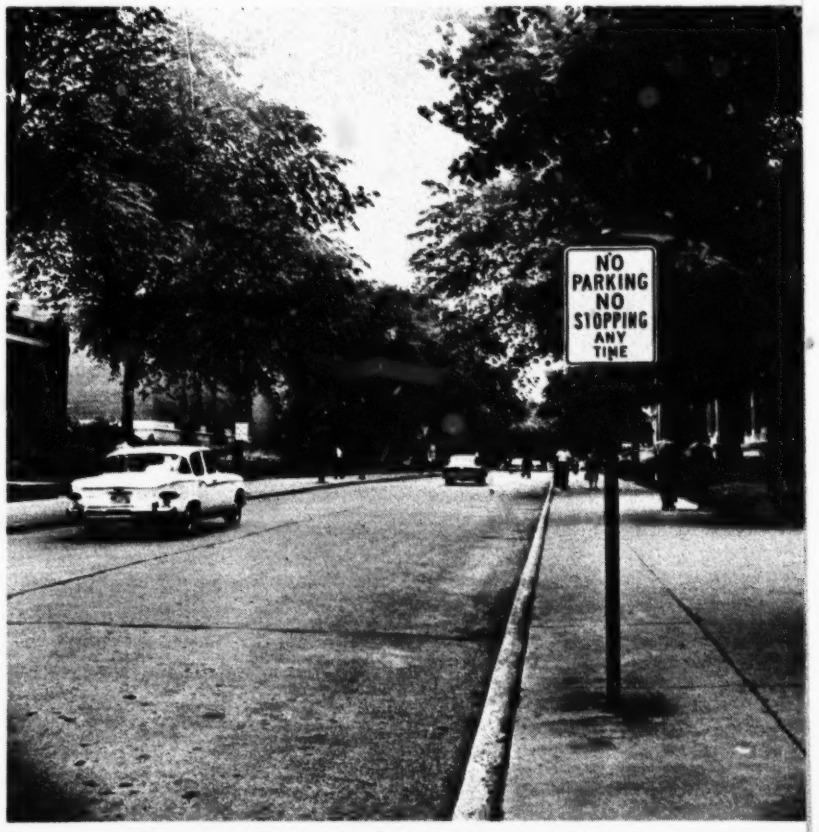
After

Photographs No. 2—This is in front of the School of Law on 15th Avenue where cars have gone over the curb and sidewalk to park on the lawn causing damage to curb and sidewalk, lawn and shrubbery around the building.

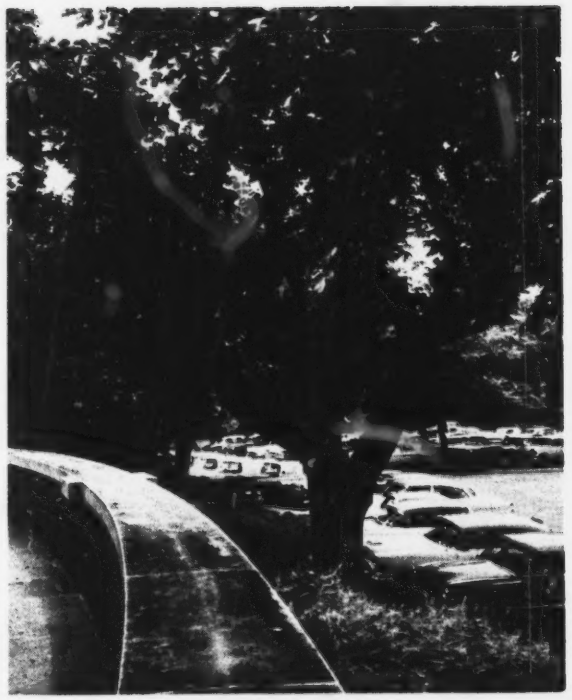


Photograph No. 3—Curb parking at the University of Chicago. The University has no control over streets running through the campus.

Photograph No. 4—A staff paid curb parking area at the University of Wisconsin.



Photograph No. 5—Curb parking restrictions at the University of Minnesota enhance the appearance of the campus and give both the driver and pedestrian an unobstructed view of the street.



Photograph No. 6

Photograph No. 7

In the opinion of the consultants, every university should strive for complete elimination of curb parking on the campus. Present curb spaces, of course, will have to be replaced by equivalent capacity in off-street facilities. This will involve a capital outlay for new parking lots or structures. Such expenditures recognize esthetic values, however, and can be justified on the same basis as investments in architectural treatment of structures, attractive landscaping and provision of open space between buildings.

OFF-STREET PARKING FACILITIES

It would be a disservice to anyone faced with the problem of planning or designing campus parking lots and garages to attempt to oversimplify the knowledge in this field and to reduce it to a few dogmatic principles and tables of basic dimensions. The only advice that can be given conscientiously is that the persons involved should review not only standard manuals and textbooks on the subject, but they should also examine critically the more important of the recent developments. (see bibliography) This implies a visit not only to observe existing university-built facilities, but also those which have been constructed in various cities throughout the nation. Only in this way can one keep abreast of all the innovations in this rapidly evolving field.

The following sections of the report describe briefly observations made while inspecting several Western Conference campuses, as well as a general summary of developments in the field of parking which should be of interest to campus planners.

Parking Lots

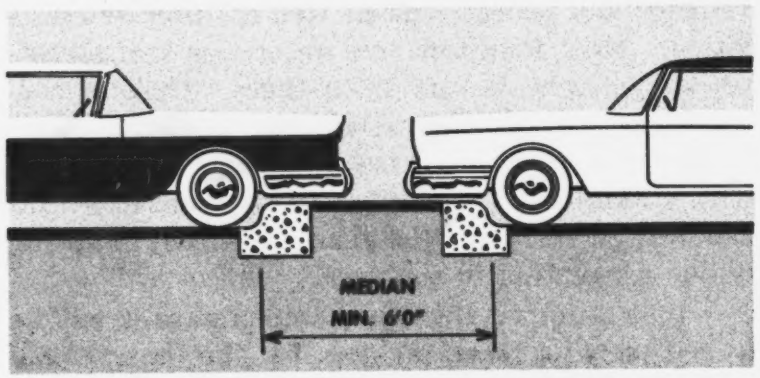
Problems connected with parking lots are usually not as complex as those related to garages. It is relatively easy to experiment with the layout of a lot, for example, and first mistakes in design can be corrected inexpensively. Let it suffice to say that criteria for design and layout of parking lots are summarized in numerous handbooks and pamphlets. Most of the discussion which follows, therefore, is applicable to site improvement as particularly related to campus parking facilities.

One of the important aspects in designing additional facilities on campuses already blackened with surface parking lots might be termed screening or hiding the parked cars. The sides and tops of automobiles do not compare esthetically with trees, grass and bushes. It is natural, therefore, that landscape architects seek means of parking vehicles without despoiling the otherwise academic atmosphere. Several developments along these lines were observed in the survey.

Photo No. 6 shows a parking lot at the University of Minnesota partially hidden from view by making use of the natural topography. The picture was taken from the top of the brick wall in the foreground. From the ground, the parking lot is far less noticeable. Through prudent adaptation to rolling or hilly terrain, the visual impact of a large number of parked cars can be greatly reduced.

Another excellent feature of this parking lot is the use of grass malls and trees beside and between rows of parked cars. This is in marked contrast to the parking lot shown in Photo No. 7. In all fairness, however, it should be mentioned that the less attractive facility is in a prime location where space is at a premium.

The front overhang of a car—the distance from the front axle to the front bumper—is approximately three feet on most standard-size American cars. A six foot median strip can be provided, therefore, between parallel rows of



parking spaces without wasting any space. This requires head-in parking, of course, since an automobile's rear overhang is greater than the front and varies considerably. If site dimensions allow, the median can be even wider than six feet and planted with trees or bushes. The mall also provides an excellent place to put parking meters.

If medians are provided, six-inch curbs are used for proper alignment of vehicles. Without medians, steel guard rails are preferable to individual wheel stops for easier cleaning and snow removal.

The most popular method of screening parking lots is shown in Photo No. 8—also taken at the University of Minnesota. The 123-space parking lot is hardly noticeable in the right-center portion of the picture, even though the site was photographed from the crest of a nearby hill. Excellent use has been made of bushes and trees to blend the parking lot into the natural setting.

At Ohio State University, the terrain is fairly flat and is of little help in screening parking lots. Photo No. 9 shows an alternate approach in situations of this type by use of a manufactured product. The screen is pleasing and helps materially to break up the otherwise monotonous view of parked cars.

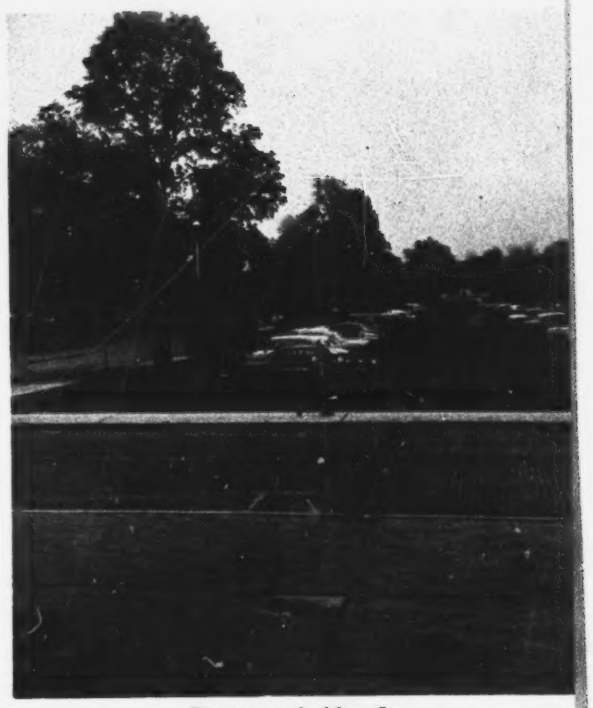
Another possibility in making parking areas less conspicuous, where the natural terrain cannot be used, is partial submersion of the lot. Although no lots of this type were found on the campuses inspected, the technique has been rather widely used in high-rise residential developments. The average automobile is less than five feet high. Thus, if the level of a parking lot is lowered two to three feet below the elevation of adjoining streets and sidewalks, the visual effect is greatly enhanced. Low hedges along the perimeter of a partially submerged parking lot also assist in screening a facility from view. The cost of submerging parking lots is frequently absorbed in grading an area that slopes too steeply for safe and convenient parking on the natural ground coutours.

Parking Garages

Almost every major parking structure built in the last five years has some unique feature which constitutes an important improvement in design. The great variety of layouts which have been used in actual construction during that period might be taken to indicate that there is a fertile field for the do-it-yourself garage designer. A more critical review, however, would show that the more successful garages are simply imaginative applications of sound principles and that in all cases the designers had studied and benefited by all of the work that had gone before.

In preparing a design for a specific parking facility, the designer must evaluate a number of fixed conditions. First priority is assigned to the available site. Its shape, value, topography, and relation to surrounding streets may pre-determine the type of facility, the traffic pattern, and the structural system. The ground area of the garage

Photograph No. 8



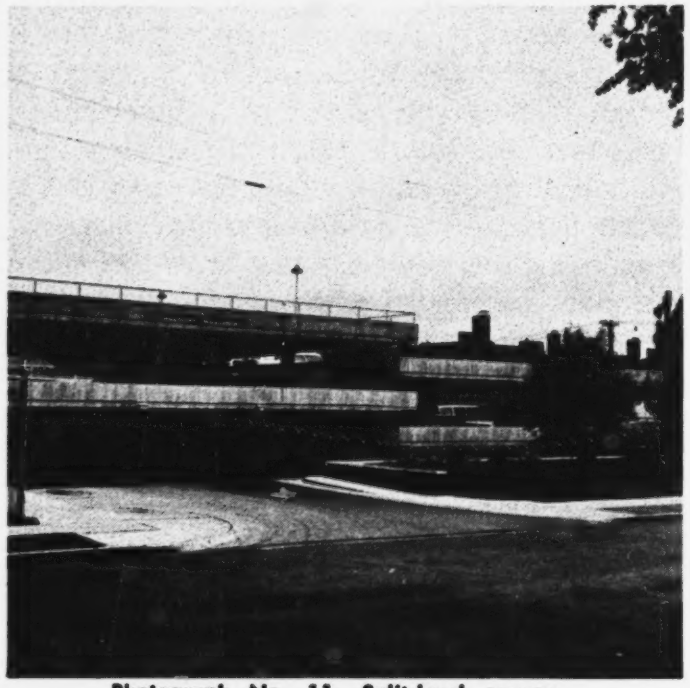
Photograph No. 9

and the number of levels are usually established by early decisions as to the number of spaces required. The availability of money is also an obvious criterion, as discussed in a later section.

Usually the dimensions of the site are not ideal for parking cars in the most efficient manner. Compromises have to be made in developing a scheme which best uses the site. Covering every square foot of available land in a pre-determined area of the campus does not necessarily mean best utilization. Often it is better to build on only part of the site, possibly landscaping the remainder or developing it for other uses.

Characteristics of traffic on streets surrounding the proposed garage influence the design, particularly on the street level. The direction and volume of both vehicular and pedestrian traffic on adjoining streets largely determines the requirements for entrance and exit movements of vehicles and pedestrians as well as interior circulation. Most facilities rely on one or two streets to carry traffic to and from them. Careful consideration should be given to such items as accessibility from entrances to the campuses, one-way streets, and prohibited turns to assure that the garage can easily be reached without causing undue congestion in the area.

Photograph No. 10—Sloping floor parking garage at the University of Michigan.



Photograph No. 11—Split-level garage at the University of Minnesota.

It is assumed that the campus garage will be a self-parking facility due to the operational costs involved in attendant parking. The requirement for self-parking makes it desirable to keep ramps reasonably flat and of shorter length than would be acceptable for professional drivers. The result is a tendency to adopt some type of sloping floor design which can vary from the continuous spiral and two-way aisles to a split-level design with sloping floors over only a portion of the total area. The accompanying photographs show a sloping floor garage at the University of Michigan and a split-level facility at the University of Minnesota. See Photos No. 10 and 11.

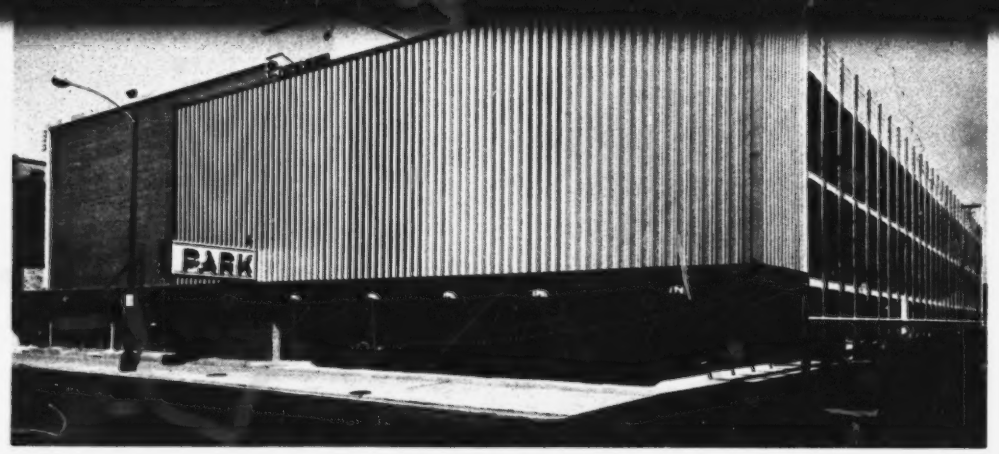
The question of angle parking versus parking perpendicular to the aisles is often dictated by site dimensions. The maximum capacity can be achieved with perpendicular parking if the site dimensions are suitable. Parking at an angle, while somewhat wasteful of space, has the advantage of expediting parking and unparking maneuvers.

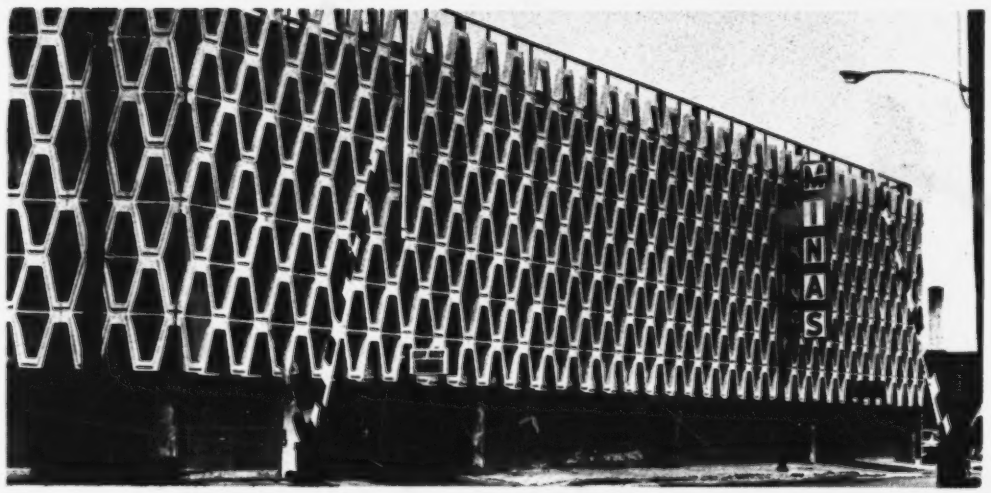
One design feature leads to another. Use of angular layout of the parking stalls makes one-way movement in the aisles almost imperative. One-way movement is desirable, furthermore, because it reduces the chances of accidents by the self-parkers. In some designs, however, particularly in connection with the continuous spiral, one-way movement makes an express exit ramp necessary.

The trend toward a clear span design is another instance of the close relation of cause and effect. Clear span design is that in which the parking alea is kept free of all columns. The rapidly developing art of prestressed concrete design and construction has made clear spans of 60 feet or more economically feasible. With certain foundation conditions, in fact, a clear span building is less expensive per car space than the more conventional framed structure with columns dividing the parking areas into three-car bays.

The obvious advantages of the clear parking floor are the saving in space otherwise occupied or made unusable by columns and the reduction in opportunities for collision with columns. See Photos No. 12 and 13. Of growing importance, however, is the further advantage of flexibility in layout of the parking area to accommodate cars which now come in wide ranges of sizes. It is noteworthy that the University of Minnesota has experienced difficulty in parking the maximum number of vehicles in underground garages on the campus. These facilities, while entirely adequate at the time of construction (circa 1928-1936) have been greatly affected by the increased car widths. Another factor in favor of maximum flexibility is the increasing number of small or "compact" cars now being marketed in the United States. Latest production figures indicate that more than 35 percent of the total vehicles currently being manufactured in America are compacts. In the clear span design, a greater number of spaces can be provided by simply relining various areas for compact cars. If in the future the trend reverses to larger vehicles, the spaces can be re-marked. The capacity of a parking garage might be increased by as much as 15 percent if all spaces were marked to accommodate compact rather than standard size cars. The layout of surface parking areas is even more flexible and can be changed easily from time to time. It would be possible in individual lots or parts of lots designed only for compact cars, therefore, to reduce stall length and aisle width dimensions. The resultant saving in space over a facility designed for larger vehicles might be as high as 35 percent. Except under unusual circumstances, however, it is recommended that the critical dimensions of parking structures—such as aisle width, stall length and turning radii—be designed to accommodate the larger cars.

Photographs No. 12 and 13—A clear span garage and one with columns located in the parking area.





Photographs No. 14 and 15—Several approaches to exterior treatment of parking garages. The garage above is in Hammond, Indiana, while the garage below is owned by the City of Chicago.

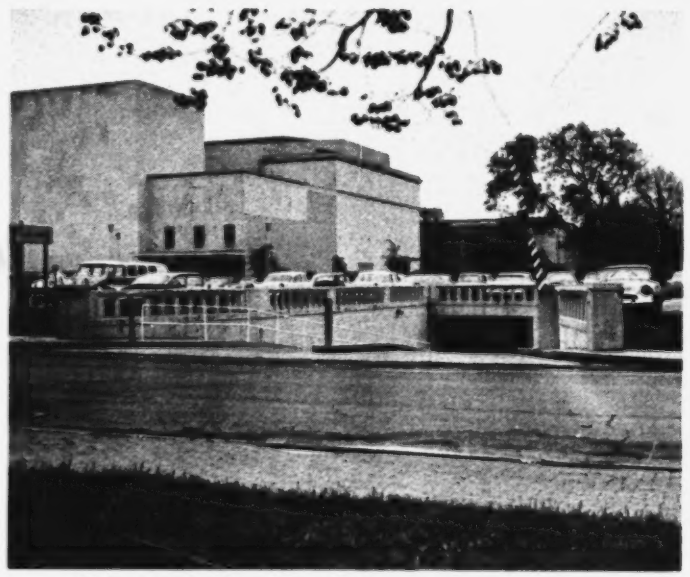
The exterior design of parking structures is another feature of paramount importance to campus planners. The accompanying photographs show various methods of treating the facade of a garage. See Photos Nos. 14 and 15. Any number of variations are possible. An acceptable appearance for a campus garage can be achieved without greatly increasing the total cost.

On many campuses the possibilities of developing underground garages are being investigated. Some of these facilities will be in the basement levels of new buildings, while others are planned in large open areas or malls.

Underground garages offer a satisfactory though often expensive solution to parking problems. The accompanying picture shows a plaza development above one of the four underground garages at the University of Minnesota. See Photo No. 16. The second photograph shows the entrance to an underground facility at Ohio State University in which the surface level has also been used for parking. See Photo No. 17.

The cost of underground garage construction will be significantly increased if the roof of the structure is to be landscaped. A minimum of four feet of fill is required for even the smallest trees, and this greatly increases structural requirements. It is suggested that if underground garage construction is contemplated, consideration be given to use of the surface area for either pedestrian plazas or recreational facilities such as tennis courts.

Photograph No. 16—An underground garage at the University of Minnesota is located beneath the plaza in the foreground of the photograph.



Photograph No. 17—Entrance to an underground garage at Ohio State University. The surface level is also used for parking.

Cost of Off-Street Parking Facilities

The cost of an individual parking lot or garage will depend, of course, on local features, such as topography and soil conditions. It is the purpose of this section of the report only to summarize briefly the general range of these costs at present-day price levels.

Improvement of areas for surface parking lots can be expected to cost from $1.00 to $1.50 per square foot, or about $300.00 to $400.00 per car space. Such improvements should include asphaltic surfacing, stall demarkation, adequate drainage, mercury vapor lighting, guard rails and landscaping. Submerging the parking lots might add 20 cents to 30 cents per square foot to this cost, for a range of $360.00 to $500.00 per car space. These figures are exclusive of the value or cost of the property involved.

The construction cost of garages varies considerably, depending on the type of structure. The following table summarizes recent construction costs of three open-deck garages at the University of Michigan and one at the University of Minnesota.

Underground garage construction is the most expensive of any considered in this report. Construction costs of recently built underground garages in the United Staates indicate that the cost per car space can be expected to be from $3500 to $4000. Difficult sub-surface conditions, severe ventilating requirements, or the necessity of providing a large amount of fill over the garage roof might increase these costs substantially. It is evident, therefore, that construction of underground garages should be considered only as a last resort.

TABLE 3
COST OF PARKING GARAGES AT UNIVERSITIES OF MICHIGAN AND MINNESOTA

Facility	Location	Year Constructed	Capacity	Construction Cost Total	Construction Cost Per Car Space
Church Street	University of Michigan	1956	469	$625,957	$1,335
Catherine Street	University of Michigan	1959	411	570,985	1,389
Thayer Street	University of Michigan	1961	443	826,801	1,866
Washington Avenue	University of Minnesota	1955	270	456,186	1,690

SITE SELECTION CRITERIA

Investigations described in earlier sections of this report have led to the conclusion that faculty, staff and visitor parking facilities are a campus necessity; that, depending on the character of the university, student parking space will be required in varying amounts; and that the ultimate goal of universities should be elimination of curb parking on the campus. It follows that the space requirements for off-street parking facilities will be of considerable magnitude, and that a master plan for parking is of utmost importance in the comprehensive campus plan.

Many universities find themselves in a seemingly endless cycle of constructing and demolishing parking lots. As demand rises for parking space, every available site is developed as a surface parking lot. Then, when land is required for construction of a new building, a parking lot must be destroyed.

Few universities can boast of unlimited space for expansion. Even in college-town locations, most campuses have been hemmed in by residential and commercial developments of the host city. In some cases, federal aid is being sought through urban renewal programs to acquire and clear additional land. Requirements for new dormitories and classroom buildings, however, usually take precedence over the needs for parking lots and garages.

It has been estimated that enrollments at Western Conference universities and the University of Chicago will increase by about sixty percent by 1970. Assuming that the current ratio of parking spaces to university population is maintained, approximately 20,000 additional spaces will be required at these eleven campuses, alone, in the next nine years. In order to provide this

number of spaces entirely in surface parking lots, an additional 140 acres of campus grounds would have to be converted to parking use or acquired for that purpose. At Indiana University, for example, approximately 1,000,000 square feet of land area would have to be given up to parking. Further conversion of the remaining open spaces to parking would involve sacrifice of lawns and landscaped areas as well as loss of potential sites for academic buildings and dormitories.

Although it is often difficult to estimate the monetary value of campus property, there is a point at which it is more economical to construct multi-level parking facilities than to build additional surface lots. Current construction costs for permanent parking lots are between $1.00 and $1.50 per square foot. Open deck garage construction costs vary between $4.50 and $6.00 per square foot. It is evident, therefore, that when the value of campus land exceeds $3.50 to $4.50 per square foot, it becomes advisable to consider construction of multi-level facilities rather than additional parking lots.

Many universities have already concluded that multi-level parking structures are, or eventually will be, required. At most of these campuses, the decision has been forced by the realization that no more space exists for expansion of surface lots.

An alternative to building structures designed entirely for parking is to incorporate one or more parking levels in new buildings intended primarily for academic or related purposes. This is not a new concept, having been used for over three decades at the University of Minnesota.

The most popular method of providing parking space within new buildings involves the use of sub-surface or basement areas. This calls for coordination of the structural requirements of a parking garage, however, with those of a classroom building. Basement space is devoted to parking, furthermore, which might otherwise have been used for laboratories, utilities or other functions related to the building.

Where the topography is favorable, a large number of parking spaces could be provided at very little additional cost on the roofs of new buildings. The design loads for parking automobiles are not prohibitive, and roof parking is free of many of the problems involved in underground or basement parking. The idea has been used many times in connection with retail stores and office buildings. No instances of its being used in connection with university buildings was revealed by the current study. This possibility should be considered where new buildings are relatively low and a ramp to the roof would be feasible.

The subject of suitable locations for parking facilities raises the question of maximum practical walking distance from parking facilities to destinations. The answer will vary with the type of use made of the space. General policy is usually to assign the most convenient parking spaces to faculty, staff and visitors.

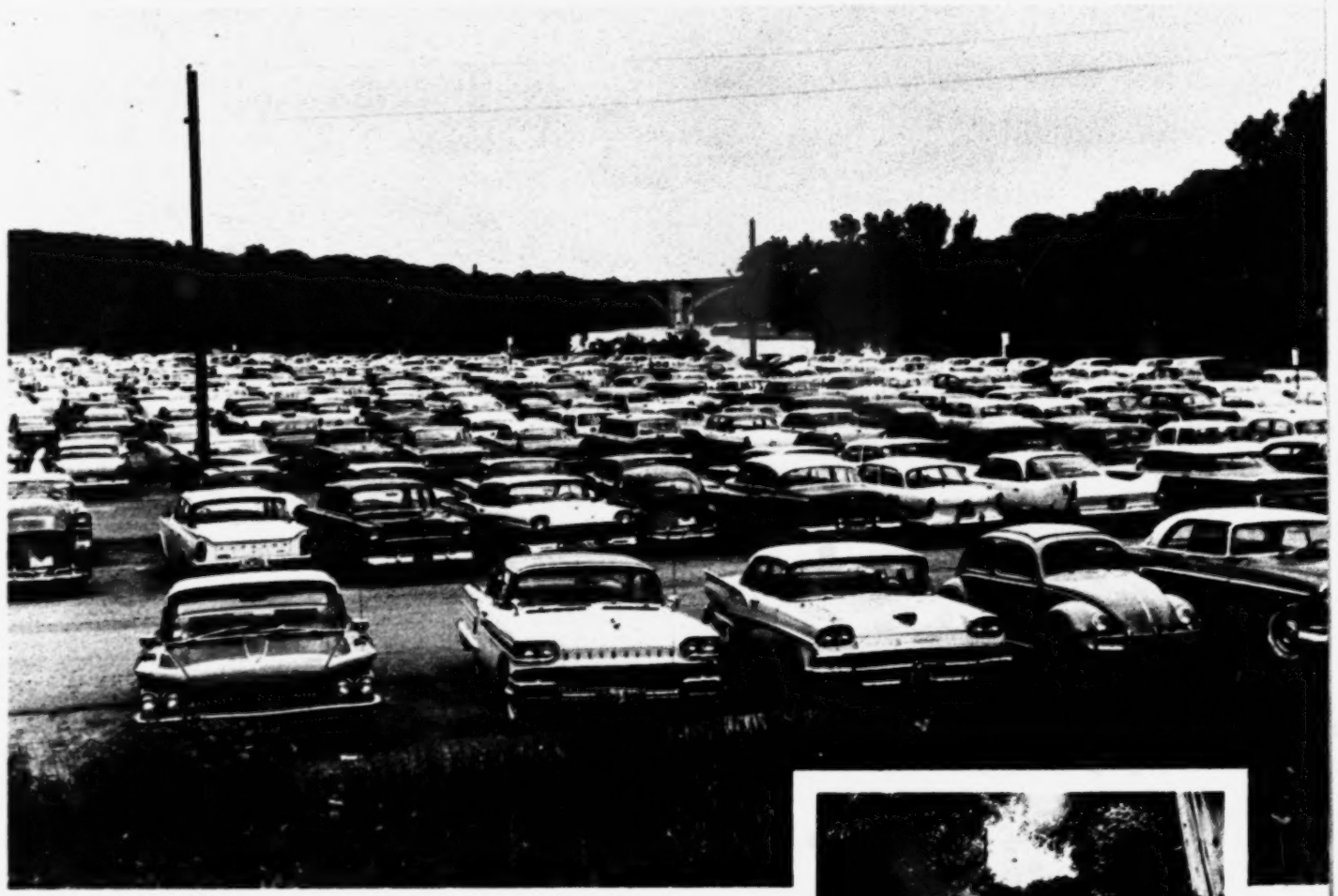
Most university faculty and staff members would like to park at the doors of their classrooms and offices. A similar statement could be made concerning those who work in the central business districts of both large and small cities. For obvious reasons, however, both university personnel and downtown workers accept something less. Experience in central business districts of medium-size cities has shown that employees walk, on the average, about 500 feet from parking space to destination. In larger cities, the distance is often considerably greater. Assuming that the average

campus compares roughly with a medium-size city, an average walking distance of 500 feet should be acceptable. The maximum, in the opinion of the consultants, should not exceed 1000 feet.

Most campuses are sufficiently compact that each parking lot or structure could serve several buildings without exceeding the above criteria. Multi-level or surface facilities on the periphery of a campus about one-half mile wide could accommodate almost all faculty, staff and visitor parkers within these criteria.

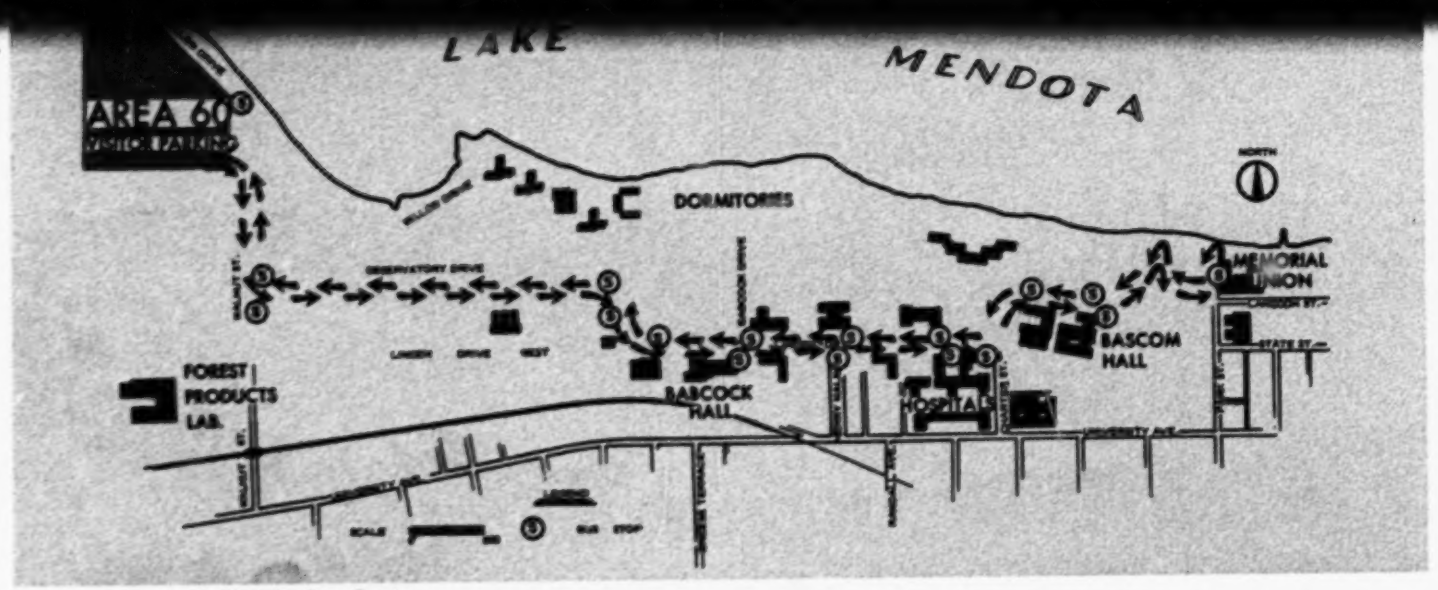
Students can be expected to accept longer walking distances from parking spaces to destination than would be aacceptable to faculty, staff or visitors. Use can sometimes be made, therefore, of large open areas somewhat removed from the campus. A large fringe parking lot operated by the University of Minnesota is shown in the accompanying photograph. See Photo No. 18. The lot is located on the bank of the Mississippi River below the level of the campus. The inset in the photograph shows the stairway connecting the parking lot with the main campus on the hills above. This lot is close to the campus to accommodate student parkers without bus service, although the stairway is a deterrent to all but the young and healthy.

The University of Wisconsin operates a shuttle bus service connecting a large fringe parking area west of the campus with various points on the main campus and the Student Union. The operation, which appears to be successful, might have application at other universities with similar problems. Of those universities returning completed questionnaires, only San Jose State College and the University of Utah reported a similar shuttle bus system presently in operation.



Photograph No. 18

The University of Wisconsin parking lot served by the shuttle bus has a capacity at the present time of about 1200 cars. Since additional land is available, the University intends to increase the number of parking spaces in the near future. Parking in the lot is free. Permits which provide unlimited bus transportation on this route are sold for $12.00 per year. A total of 1,214 permits were sold in 1960-61, of which 705 were to students. Parkers or others who do not hold a permit must pay a cash fare of ten cents to use the bus. The shuttle buses also serve



Campus Shuttle Bus Route
University of Wisconsin

Photograph No. 19—A University of Wisconsin shuttle bus and typical bus stop.

dormitories, the University Hospital and many academic buildings on the approximately two-mile trip between the parking lot and the Memorial Union. See Exhibit. The total time for a one-way trip is less than fifteen minutes.

The shuttle bus service is operated by the local transit company under a contract with the university. Seven buses were assigned to the service in 1960-61, providing minimum headways of two minutes between buses in the peak periods. Midday service is at intervals of about five minutes. The University estimates that bus passengers number over 1,000,000 per year at present levels, of which about one-half pay cash fares. The contract with the bus company stipulates the following payments:

(a) $1,620.00 per year for each bus assigned to the service;

(b) $ 2.48 per hour for each driver; and

(c) $ 0.11 for each mile traveled.

Since bus fares and annual permits do not cover the expense of maintaining this service, the shuttle bus system is subsidized from revenues derived from other parking areas. Revenues from the University of Wisconsin parking program as a whole, however, more than cover current operating expenses.

There is a break-even point, of course, at which it would be more economical for a university under similar circumstances to operate rather than contract for bus service. This would be influenced by the amount and type of equipment already owned by the university as well as by the maintenance facilities available. For example, some schools operate and maintain sizable fleets of cars, buses and trucks. The addition of a few buses might be considered a routine expansion under such circumstances.

It is reasonable to conclude that if a shuttle bus service to a fringe parking lot can be operated at a small deficit, the service is a success. Provision of the same number of parking spaces closer to the campus would, in all likelihood, involve the use of much more costly land or a large investment in parking structures as well as loss of potential sites for academic buildings.

The University of Detroit has also reported an interesting approach to the student parking problem as related to big-city universities. Realizing that enough parking space could not be provided in prime locations to accommodate one car for each student, the University has organized a car-pool system applicable to the most conveniently located student parking facility on the campus. Student who desire parking permits for this lot must register for a car-pool. One parking permit is issued to each group. Applicants may form in voluntary groups or be assigned to one by the University Administration. Total student parking space demand might be reduced by as much as 80 percent in this way, with a reduction of 50 percent to 60 percent perhaps more realistically attainable.

In general, the trend at universities was found to be toward fringe parking—even where

multi-level facilities were provided. Successful experience in removing students cars from the campus through use of outlying lots with shuttle bus service, car pools and other imaginative programs indicates that these ideas are worthy of consideration by all universities.

$$$$ FINANCING $$$$

Discussion to this point has concerned type, location and approximate cost of parking facilities, Mention should be made of ways to finance capital improvements necessary to the parking program. For many schools, this is the most perplexing part of the parking problem.

It was evident throughout the study that the era of free parking at universities is drawing to a close. Over three-quarters of the universities included in the Western Conference and the University of Chicago have established fees for parking ranging from $5.00 to $110.00 per year. Most also reported surpluses in the parking fund which presumably will be used to finance new facilities.

Parking fees in the magnitude of $60.00 to $110.00 per year might be sufficient to meet operating expenses and amortize the cost of surface parking improvements. They will be inadequate, however, to finance the new multi-level or subsurface facilities which will be required on most campuses. It would be unfair, moreover, to expect direct parking fees to cover the whole cost of providing the required facilities. The university as a whole receives benefits from off-street parking facilities in the form of enhanced appearance, greater safety for pedestrians, greater likelihood of drawing and holding high-caliber faculty and staff members, and improved public relations with the many types of important visitors.

The immediate task faced by university administrations, in the opinion of the consultants, is to convince the public or private bodies which provide financial support of the necessity of providing adequate parking facilities.

Except in central business districts of the largest cities, most municipally-financed off-street parking facilities are subsidized in one way or another. This often takes the form of pledging revenue from curb parking meters to assist in meeting debt charges incurred in financing new lots or garages. Such a course will not be open to the university, however, if the recommended goal of eliminating curb parking is realized. It is evident, therefore, that a subsidy of some form is required to make up the difference between the amount which can reasonably be derived from fees charged for campus parking and the amount required to finance capital improvements.

Many cities also have zoning ordinances requiring off-street parking in conjunction with new buildings just as they require builders to provide water supply, sewerage and sidewalks. The adoption of reasonable parking space standards at universities, therefore, would be based on sound precedents. The university is faced with a planning problem similar to that of cities—protecting existing values in land and buildings, and providing for future growth in desirable patterns. The agencies providing financial support, when they understand the situation, will probably agree that comparatively small additional investments in parking facilities will tend to protect the large sums which have been, or will be, spent for the university plant.

SUMMARY OF REPORT

This report concerns a survey of parking programs now in effect at universities included in the Western Conference and at the University of Chicago. Inspection trips were made to six of these universities and questionnaires were sent to the remainder. Questionnaires were also sent to 72 other large universities.

The statistical results of the questionnaire survey will be found in the appendix to the report. It is hoped that they will be useful to those pursuing this matter further, and that they will lead to specific solutions of parking problems. The report itself is general in nature, summarizing what are believed to be the most important points. It was found impossible to evolve an easy do-it-yourself parking program for application to all colleges regardless of size or type. Problems and practical solutions vary with the characteristics of each school. The report discusses principles and policies, therefore, rather than specifics.

It has been concluded from the study that adequate parking space for faculty, staff, employees and visitors to the campus, as well as for part-time, disabled and local resident students should be considered a necessity rather than a luxury. Parking space for students living in university housing or within easy walking distance of the campus, while desirable, should be subordinated to the previously mentioned requirements. The parking problem is more critical, therefore, at big-city universities than at those in college-town locations because of higher proportions of part-time and local resident students attending the former.

In the opinion of the consultants, it is the university's obligation to either prohibit the use of automobiles by students or to provide adequate parking space for student cars. This is not to say that these spaces need be adjacent to, or even close to, the university buildings, nor that they should be provided free of charge. It should be the policy, however, to provide in some location—possibly on the fringe of the campus or in an outlying area—sufficient parking space to remove these vehicles from both campus and neighboring streets.

The consultants recommended that, as an ultimate goal, universities should strive to eliminate curb parking from the campus. This is important from the viewpoint of traffic safety as well as for esthetic reasons. Elimination of curb parking in the face of increased parking demand will probably necessitate consideration of multi-level parking structures.

The capital cost of new parking structures should be considered a protection of the present investment in campus facilities. Just as zoning ordinances of cities require off-street parking facilities to be provided in new buildings, it is the responsibility of those allocating capital funds for campus improvements to understand that parking facilities are a necessary adjunct to existing and planned university buildings. While faculty, staff, employees and students should be required to pay a reasonable fee for the privilege of parking on the campus, it would be unfair to expect these groups to support the total cost of new improvements which are intended in large measure to preserve and enhance essential features of the university. The time is at hand when public and private agencies allocating funds to universities must accept the fact that off-street parking facilities will have to be provided as an integral part of a modern educational institution.

APPENDIX

DE LEUW, CATHER & COMPANY
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CHICAGO 6
FINANCIAL 6-0424

GENERAL INFORMATION QUESTIONNAIRE
UNIVERSITY FACILITIES RESEARCH CENTER
PARKING FACILITIES STUDY

Name of University or College _____

Location _____

Support: _____ Public _____ Private _____ Both

PART I - UNIVERSITY POPULATION

Total Number of students enrolled, Spring 1961

	Number of Undergraduate Students	Number of Graduate Students
Full-time		
Part-time (day)		
Part-time (night)		
Living in Residence Halls		
Living in Fraternity, Sorority or other approved housing		
Living in married student housing		
Local residents (Commuters)		

Number of faculty members _____

Number of other University employees _____

Number of employees of other organizations (research agencies, government, etc.) working on campus _____

Estimated number of daily visitors (exclusive of athletic events, concerts, etc.) _____

Anticipated future campus population:

	Students	Faculty	Staff
1965			
1970			

PART II - GENERAL

Does the University require registration of privately owned automobiles

			If yes, number of automobiles registered--Spring 1961
by undergraduate students?	____ yes	____ no	_____
by graduate students?	____ yes	____ no	_____
by faculty?	____ yes	____ no	_____
by staff or employees?	____ yes	____ no	_____

What is the penalty for not registering an automobile? _____

What percentage of student automobiles would you estimate are registered? _____

Does the University sell or issue parking emblems or stickers

to students?	____ yes	____ no	(Fee = $ ____ per ____)
to faculty?	____ yes	____ no	(Fee = $ ____ per ____)
to staff or employees?	____ yes	____ no	(Fee = $ ____ per ____)

Note: If possible, please enclose a typical emblem or sticker.

Are all faculty, staff and students allowed to operate automobiles on or near the campus? ____ yes ____ no. If no, please explain: _____

_____

_____

Which of the following are allowed to park on the campus? (please check)

____ Faculty
____ Staff
____ Visitors
____ Graduate students
____ Undergraduate students (If only certain classes, please indicate)

Is the campus served by local public transportation lines? ____ yes ____ no

If yes, will you estimate the percentage of faculty, staff and students commuting to the campus by public transportation?

____% of faculty
____% of staff
____% of students

Does the University enforce parking regulations on campus streets? ____ yes ____ no

Is curb parking permitted on the campus? ____ yes ____ no

If yes, approximately how many spaces?----------_____
How are these spaces controlled (parking meters, permits, etc.)? _____

Has the University experienced any difficulty with respect to student or staff cars parked on residential streets near the campus? ____ yes ____ no. If yes, please explain: _____

Are fines imposed for violation of parking regulations (curb and off-street)?

____yes ____ no If yes, please enclose a list of fines.

PART III - EXISTING PARKING FACILITIES

This section of the questionnaire pertains only to parking lots used daily for normal campus activities. Omit special-use facilities used only for athletic events, etc. A special form (Sheet 3-A) has been provided for parking garages.

How many parking lots are presently in operation? _____

What is their total capacity? _____ parking spaces

Of these spaces,

_____ are for use by students.
_____ are for use by faculty.
_____ are for use by staff.
_____ are for use by visitors.
_____ are available to anyone.

Please indicate the method of control used.

_____ spaces controlled by special permits.
_____ spaces controlled by parking meters (Rate: $____ per ____)
_____ spaces controlled by cashiers (Rate: $____ per ____)
_____ spaces controlled by automatic gates (Rate: $____)
_____ spaces controlled by other methods (please explain: _____
_____)

How many of the present parking lot spaces have been provided in conjunction with University residence halls? _____

Approximately how many existing spaces will be eliminated by new building construction in the next three years? _____

Does the University operate shuttle-bus service from any parking lots to the campus? ____ yes ____ no

If yes, Number of parking spaces served by shuttle bus _____

Service operates each ____ minutes.
Charge is $____ per trip.

What is the total annual revenue from parking (lots, garages, curb meters, registrations, fines, etc.)? $_____

What is the total annual operating expense of present parking facilities? $_____

How were present parking facilities financed? _____

_____

_____

_____

_____

This form pertains only to parking garages. Will you please furnish the following information for each garage. If your institution does not have any parking garages, please omit this section.

Location of garage: _____

Year constructed: _____

Capacity: _____ car spaces

Number of levels: _____ above ground _____ below ground

Building Dimensions: _____ ft. x _____ ft.

Column Spacing (per bay): _____ ft. x _____ ft.

Type of construction: ____ Unprotected steel
____ Reinforced concrete
____ Other (Explain: _____)

Type of design: ____ Split level
____ Straight ramp
____ Spiral ramp
____ Sloping floor
____ Other (Explain: _____)

Type of control (special permit, cashier, gates, etc.) _____

Rate charged for parking $ _____

Is this garage used exclusively by ____ students?
____ faculty?
____ staff?
____ open to anyone.

Construction Cost: Land $_____ (If available)

Improvements _____

Total $

PART IV - FUTURE PLANS

Have you definite plans for constructing additional parking facilities in the next two years? _____ yes _____ no; in the next ten years? _____ yes _____ no

If yes, please indicate how many spaces:

_____ spaces in parking lots (2 yrs) _____ (10 yrs)
_____ spaces in parking garage (2 yrs) _____ (10 yrs)

How will these be financed? _____

_____

Have you made use or do you intend to make use of Section 112 of Title I of the Housing Act of 1949 (Urban Renewal) to acquire additional land for parking? _____ yes _____ no

Please use the remainder of this sheet for any comments which you think might be of value to the survey.

Name of person completing form: _____
Title or position: _____
Address: _____

CAMPUS POPULATION—PRESENT AND FUTURE

University or College	Location	Campus Population					Anticipated Future Enrollment			
							1965		1970	
		Students	Faculty	Staff	Daily Visitors	Total	Number	Percent Increase	Number	Percent Increase
University of Chicago	Chicago, Ill.	6,035	860	6,650	Na	13,545	7,000	16	8,100	34
University of Illinois	Urbana, Ill.	20,102	3,690	3,386	500	27,678	25,100	25	32,500	62
Indiana University	Bloomington, Ind.	14,487	1,000	2,136	125	17,748	19,535	35	23,563	63
State University of Iowa	Iowa City, Iowa	10,388	694	3,116	Na	14,198	12,500	20	16,000	54
University of Michigan	Ann Arbor, Mich.	24,229	2,200	6,900	150	33,479	26,000	7	33,000	36
Michigan State University	East Lansing, Mich.	19,225	1,814	5,000	500	26,539	27,000	40	35,000	82
University of Minnesota	Minneapolis, Minn.	26,785	2,300	4,800	300	34,185	36,100	35	38,000	42
Northwestern University	Evanston, Ill.	7,103	1,900	1,600	300	10,903	Na	Na	6,600	Na
Ohio State University	Columbus, Ohio	23,816	1,336	1,280	500	26,932	33,000	38	42,000	76
Purdue University	Lafayette, Ind.	14,444	1,162	4,483	400	20,489	19,243	33	23,377	62
University of Wisconsin	Madison, Wis.	17,932	2,423	3,749	200	24,304	23,800	33	31,500	70
University of Arizona	Tucson, Ariz.	11,564	950	2,720	116	15,250	20,361	76	29,431	155
Brigham Young University	Provo, Utah	11,876	910	500	300	13,586	15,900	34	17,450	47
University of California at Los Angeles	Los Angeles, Calif.	31,918	2,400	1,756	3,100	39,174	24,000	—	27,500	—
University of Cincinnati	Cincinnati, Ohio	18,563	1,347	625	Na	20,535	20,336	10	24,162	30
University of Colorado	Boulder, Colo.	10,961	515	1,300	200	12,976	13,000	19	15,000	37
University of Detroit	Detroit, Mich.	15,740	672	350	50	16,812	12,000	—	15,000	—
Fairleigh Dickinson University	Rutherford, N. Y.	Na	350	150	25	Na	Na	—	Na	—
University of Florida	Gainesville, Fla.	13,638	2,400	6,000	250	22,288	15,500	13	18,000	32
University of Georgia	Athens, Ga.	8,000	500	1,000	225	9,725	9,500	19	12,000	50
Kent State University	Kent, Ohio	9,125	390	600	100	10,215	11,500	26	15,000	64
Long Beach State College	Long Beach, Calif.	11,584	450	475	110	12,619	14,000	21	18,000	55
Los Angeles State College	Los Angeles, Calif.	14,642	693	766	65	16,166	27,200	86	34,000	132
Louisiana State University	Baton Rouge, La.	9,326	750	1,750	Na	11,826	Na	—	Na	—
Marquette University	Milwaukee, Wis.	8,493	494	673	100	9,760	Na	—	Na	—
University of Maryland	College Park, Md.	14,335	1,300	2,100	250	17,985	17,000	19	24,000	67
University of Nebraska	Lincoln, Neb.	8,465	Na	Na	Na	8,465	—	—	—	—
University of Pennsylvania	Philadelphia, Penn.	17,900	3,480	1,740	450	23,570	20,500	15	23,000	27
Saint Louis University	St. Louis, Mo.	10,000	1,000	500	100	11,600	12,000	20	15,000	50
San Francisco State College	San Francisco, Calif.	11,512	680	560	45	12,797	15,000	30	Na	—
San Jose State College	San Jose, Calif.	14,933	800	700	Na	16,433	16,000	7	20,000	34
Stanford University	Stanford, Calif.	8,569	650	3,000	1,000	13,219	10,085	17	11,335	32
Syracuse University	Syracuse, N. Y.	18,850	1,200	2,400	1,000	23,450	16,000	—	19,000	—
Temple University	Philadelphia, Penn.	18,100	1,600	900	300	20,900	35,000	93	40,000	121
Washington University	St. Louis, Mo.	13,200	525	300	Na	14,025	Na	—	Na	—
University of Washington	Seattle, Wash.	27,439	1,900	4,588	2,500	36,427	24,000	—	28,000	2
Western Michigan University	Kalamazoo, Mich.	8,827	497	699	Na	10,023	13,100	49	17,950	104
University of Utah	Salt Lake City, Utah	10,135	630	2,283	1,000	14,048	13,500	33	19,000	87

Na—No answer.

EXHIBIT 2 CHARACTERISTICS OF THE UNIVERSITY

University or College	Campus Population as a Percentage of Population of City(ies)	Percentage of Student Body: Graduate Students	Percentage of Student Body: Part-Time Students	Percentage of Student Body: Living in Dormitories, Fraternities, Sororities or Other Approved Housing	Special Restrictions Regarding Parking or Driving on Campus
University of Chicago	0.4	63	3	37	None
University of Illinois	37.0	22	12	63	Undergraduate parking not permitted weekdays from 1:00 AM–6:00 PM
Indiana University	56.2	27	0	58	Freshman & students on probation not permitted cars unless Dean permits
State University of Iowa	42.5	21	0	81	None
University of Michigan	49.8	39	0	45	Students must be 21 or have special permission to have car
Michigan State University	19.0	19	16	60	Freshman residents not permitted to have cars
University of Minnesota	4.3	13	13	45	None
Northwestern University	13.4	20	11	59	Freshman residents not permitted to have cars
Ohio State University	5.1	24	Na	59	None
Purdue University	36.7	20	2	81	Freshman and Sophomores not permitted to have cars
University of Wisconsin	19.0	23	Na	41	No driving on campus—students—7:00 AM–5:00 PM Mon.–Fri. & 7:00 AM–12 Noon Sat.
University of Arizona	7.2	14	40	32	Student cars not allowed on campus—7:00 AM–5:00 PM
Brigham Young University	37.7	5	17	72	None
University of California at Los Angeles	1.5	18	46	12	Student parking permits are limited
University of Cincinnati	4.1	10	53	11	None
University of Colorado	34.3	13	Na	46	First semester Freshman not permitted cars
University of Detroit	1.0	10	31	8	None
Fairleigh Dickinson University	Na	Na	Na	Na	None
University of Florida	74.2	22	Na	47	Freshmen and Sophomores with less than 3.0 average not permitted cars
University of Georgia	25.5	Na	Na	95	Freshman not permitted cars
Kent State University	56.7	10	12	38	Campus residents not permitted cars
Long Beach State College	2.9	24	46	8	None
Los Angeles State College	0.7	31	60	1	None
Louisiana State University	7.8	21	23	46	Freshman cars not allowed on main campus from 7:30 AM to 3:30 PM
Marquette University	1.3	11	32	26	None
University of Maryland	96.5	16	6	45	None
University of Nebraska	Na	Na	Na	Na	None
University of Pennsylvania	1.2	40	59	31	None
Saint Louis University	1.5	10	50	10	None
San Francisco State College	1.7	29	43	8	None
San Jose State College	8.1	5	21	43	Only faculty, staff and visitors allowed to park on campus
Stanford University	26.4	40	14	55	None
Syracuse University	10.5	34	31	35	Resident Freshman & Sophomores not permitted cars. Only faculty, visitors & some staff allowed to park
Temple University	1.0	6	64	6	None
Washington University	1.9	Na	58	8	None
University of Washington	6.2	12	30	56	Only disabled students, faculty, staff & visitors allowed cars
Western Michigan University	12.2	12	Na	47	None
University of Utah	6.9	19	22	14	None

EXHIBIT 3 PUBLIC TRANSPORTATION AND CURB PARKING

University or College	Is Campus Served by Public Transportation?	Estimated Percentage Commuting by Public Transportation			Does University Enforce Parking Regulations on Campus Streets?	Is Curb Parking Permitted on Campus?	Curb Parking Spaces	
		Students	Faculty	Staff			Number	Percent of Total Spaces
University of Chicago	yes	Na	Na	Na	no	yes	2,000	57.9
University of Illinois	yes	1	1	1	yes	yes	983	18.4
Indiana University	no	0	0	0	yes	yes	936	15.6
State University of Iowa	yes	10	10	10	yes	yes	600	13.7
University of Michigan	yes	nil	nil	nil	no	yes	2,000	22.9
Michigan State University	yes	0	1	1	yes	yes	2,240	25.3
University of Minnesota	yes	Na	Na	Na	yes	yes	—	—
Northwestern University	yes	Na	Na	Na	yes	yes	500	16.6
Ohio State University	yes	—	8	—	yes	yes	—	—
Purdue University	yes	5	5	10	yes	yes	1,100	23.4
University of Wisconsin	yes	5	10	10	yes	yes	260	5.2
University of Arizona	yes	10	3	10	yes	yes	11	0.4
Brigham Young University	yes	nil	nil	10	yes	no	0	0
University of California at Los Angeles	yes	8	1	3	Na	yes	635	7.3
University of Cincinnati	yes	40	—	5	yes	yes	300	13.0
University of Colorado	yes	5	2	5	yes	yes	561	18.7
University of Detroit	yes	25	5	15	yes	no	0	0
Fairleigh Dickinson University	yes	10	5	1	yes	no	0	0
University of Florida	no	0	0	0	yes	yes	1,050	29.5
University of Georgia	no	0	0	0	yes	no	0	0
Kent State University	yes	nil	nil	nil	yes	yes	440	19.0
Long Beach State College	yes	5	2	2	yes	yes	163	4.6
Los Angeles State College	yes	30	5	5	yes	yes	80	3.1
Louisiana State University	yes	5	2	2	yes	yes	1,600	26.7
Marquette University	yes	85	90	95	no	yes	250	28.3
University of Maryland	yes	3	3	3	yes	no	0	0
University of Nebraska	yes	Na	Na	Na	yes	yes	795	17.6
University of Pennsylvania	yes	Na	Na	Na	no	yes	2,500	56.1
Saint Louis University	yes	50	50	50	no	no	100	12.8
San Francisco State College	yes	25	15	20	yes	yes	75	6.2
San Jose State College	yes	10	15	5	no	no	0	0
Stanford University	no	0	0	0	yes	yes	3,500	64.0
Syracuse University	yes	5	2	5	yes	yes	800	15.0
Temple University	yes	98	90	95	no	yes	600	50.0
Washington University	yes	—	10	—	yes	yes	3,200	50.0
University of Washington	yes	5	2	2	yes	yes	1,000	12.5
Western Michigan University	yes	nil	nil	nil	yes	yes	44	1.1
University of Utah	yes	5	1	2	yes	yes	250	3.4

EXHIBIT 4 EXISTING PARKING FACILITIES

	Existing Off-Street Parking Spaces			Number of Parking Spaces Assigned to				Ratio: Total Number of Off-Street Spaces to Number of	
	Lots	Garages	Total	Students	Faculty and Staff	Visitors	Not Assigned	Students	Faculty and Staff
University of Chicago	1,451	0	1,451	—	740	—	711	0.2	0.2
University of Illinois	4,353	0	4,353	947	3,056	350	—	0.2	0.6
Indiana University	5,045	0	5,045	287	1,435	88	3,246	0.3	1.6
State University of Iowa	3,757	0	3,757	2,000	1,500	50	207	0.4	1.0
University of Michigan	5,387	1,323	6,710	433	4,532	—	1,745	0.3	0.7
Michigan State University	6,608	0	6,608	4,208	← 2,400 →		—	0.3	1.0
University of Minnesota	6,111	1,316	7,427	178	942	—	5,037	0.3	1.0
Northwestern University	2,500	0	2,500	—	—	—	—	0.4	0.7
Ohio State University	6,900	425	7,325	4,155	2,030	888	—	0.3	2.8
Purdue University	3,600	0	3,600	—	← 2,035 →		1,565	0.2	0.6
University of Wisconsin	4,692	0	4,692	← 3,616 →			1,076	0.3	0.8
University of Arizona	2,258	0	2,258	1,371	817	70	—	0.2	0.6
Brigham Young University	3,723	0	3,723	2,783	← 940 →		—	0.3	2.6
University of California at Los Angeles	7,966	888*	8,854	2,475	5,491	—	—	0.3	2.1
University of Cincinnati	2,000	0	2,000	← 2,000 →			—	0.1	1.0
University of Colorado	2,425	0	2,425	1,377	1,048	—	—	0.2	1.3
University of Detroit	1,971	0	1,971	1,353	578	40	—	0.1	1.9
Fairleigh Dickinson University	300	0	300	230	60	10	—	—	0.6
University of Florida	2,500	0	2,500	← 2,500 →			—	0.2	0.4
University of Georgia	4,600	0	4,600	3,950	650	—	—	0.6	3.1
Kent State University	1,864	0	1,864	1,590	274	—	—	0.2	1.9
Long Beach State College	3,322	0	3,322	2,458	794	15	55	0.3	3.6
Los Angeles State College	2,483	0	2,483	1,716	647	46	—	0.2	1.7
Louisiana State University	4,375	0	4,375	3,500	857	—	—	0.5	1.9
Marquette University	632	0	632	—	398	—	234	0.1	0.5
University of Maryland	6,450	0	6,450	1,700	2,050	150	2,550	0.4	1.9
University of Nebraska	3,698	0	3,698	—	—	—	—	0.4	—
University of Pennsylvania	1,950	400*	2,350	550	1,200	200	—	0.1	0.5
Saint Louis University	680	0	680	314	366	—	—	0.1	0.6
San Francisco State College	1,118	1,200*	2,318	544	← 594 →		—	0.2	1.9
San Jose State College	356	0	356	—	356	10	—	0.0	0.2
Stanford University	1,962	0	1,962	1,210	752	—	—	0.2	0.5
Syracuse University	4,500	0	4,500	2,800	1,600	100	—	0.2	1.3
Temple University	600	0	600	← 600 →		—	—	0.0	0.2
Washington University	3,200	0	3,200	2,600	← 800 →		—	0.2	3.9
University of Washington	8,000	0	8,000	4,000	← 4,000 →		—	0.3	1.2
Western Michigan University	3,760	0	3,760	2,916	802	42	—	0.4	3.1
University of Utah	7,005	0	7,005	5,469	975	459	—	0.7	2.4

* Under construction.

EXHIBIT 5 ECONOMIC ASPECTS OF CAMPUS PARKING

	Approximate Range of Parking Fees	Operating Statistics: Annual Revenue*	Operating Statistics: Expense of Maintenance and Operation	Operating Statistics: Annual Surplus or (Deficit)	How Were Present Facilities Financed?
University of Chicago	$3.50 per quarter to $.25 per day	$ 11,175	$ 3,388	$ 7,787	Partly through revenues
University of Illinois	$60 per year to $15 per semester	90,000	24,000	66,000	Capital appropriations and revenue bonds
Indiana University	$.10 per hour	Na	Na	Na	Na
State University of Iowa	$18 per year to $3 per year	60,000	25,000	35,000	University monies and parking permit fees
University of Michigan	$25 per year to $.25 per day	155,858	30,404	125,454	Parking receipts
Michigan State University	$3 per year to $3 per year plus $.10 per day	41,000	5,000	36,000	General funds
University of Minnesota	$.15 per day to $110 per year	588,109	450,775	137,334	Parking receipts
Northwestern University	$5 per year	22,000	18,000	4,000	Na
Ohio State University	$4 per year to $10 per year	146,288	131,714	14,574	Parking receipts
Purdue University	Free	1,000	—	—	State monies and bond issues
University of Wisconsin	$12 per year to $36 per year	175,410	105,888	69,522	Parking permit fees
University of Arizona	$10 per year	20,000	12,000	8,000	Traffic income
Brigham Young University	$5 per year	Na	Na	Na	General funds
University of California at Los Angeles	$50 per year to $22 per semester plus $.50 per day	700,599	268,491	432,108	Regents' loans and FHA financing
University of Cincinnati	$18 per year	48,825	27,271	21,554	University monies and parking receipts
University of Colorado	$5 per year	13,000	Na	Na	University monies
University of Detroit	$5 per semester	2,500	10,000	(7,500)	University monies
Fairleigh Dickinson University	Free	2,500	8,500	(6,000)	Na
University of Florida	Free	5,000	—	—	State Road Department
University of Georgia	$3 per quarter	38,000	—	—	Plant operations, budget and fines and permit sales
Kent State University	Free	5,000	1,000	4,000	University monies
Long Beach State College	$13 per semester	135,000	45,000	90,000	State monies
Los Angeles State College	$13 per semester	210,000	56,000	154,000	State monies
Louisiana State University	Free	19,814	Na	Na	Na
Marquette University	$10 per year to $.25 per day	14,000	1,200	12,800	University monies
University of Maryland	Free	39,000	3,000	36,000	General funds
University of Nebraska	$1 per year to $.05 per hour	18,299	Na	Na	Regular funds, fees, fines, and permits
University of Pennsylvania	$50 per year	250,000	100,000	150,000	Parking receipts
Saint Louis University	$.20 per day	21,400	18,000	3,400	University monies
San Francisco State College	$13 per semester to $.25 per day	45,480	26,688	18,792	Adjacent building construction funds
San Jose State College	$13 per semester	11,650	7,500	4,150	State monies
Stanford University	$10 per year	40,530	15,000	25,530	Vehicle registration and general funds
Syracuse University	Free	4,000	5,000	(1,000)	General funds
Temple University	$2 per year plus $.25 per day	34,000	34,000	0	University monies
Washington University	$4 per year	30,000	45,000	(15,000)	Na
University of Washington	$40 per year to $.50 per day	200,000	160,000	40,000	Parking receipts
Western Michigan University	Free	4,732	16,000	(11,268)	Building construction funds, fines and special appropriations
University of Utah	$1 per year	27,107	Na	Na	State monies

* Annual revenue includes, in some instances, revenue derived from fines and curb parking meters as well as from off-street facilities.
Na—No answer.

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University of Chicago
University of Illinois
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University of Michigan
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University of Minnesota
Northwestern University
Ohio State University
Purdue University
University of Wisconsin
University of Arizona
Brigham Young University
University of California at Los Angeles
University of Cincinnati
University of Colorado
University of Detroit
Farleigh Dickinson University
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University of Georgia
Kent State University
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University of Pennsylvania
Saint Louis University
San Francisco State College
San Jose State College
Stanford University
Syracuse University
Temple University
Washington University
University of Washington
Western Michigan University
University of Utah

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Committee on Institutional Cooperation

This is a voluntary organization of the following eleven middle western universities: University of Chicago, University of Illinois, Indiana University, State University of Iowa, University of Michigan, Michigan State University, University of Minnesota, Northwestern University, The Ohio State University, Purdue University and The University of Wisconsin. Officially named the "Committee on Institutional Cooperation of the Council of Ten and the University of Chicago," the unit grew out of a series of informal meetings of the presidents of the universities and was formally constituted in 1957. The Committee is made up of one representative from each institution, appointed by his president. A small professional staff carries out the programs approved by the Committee.

The goal of the Committee is to improve educational and public services and research pursuits while minimizing costs by: (1) encouraging cooperative efforts among the eleven institutions, (2) identifying specialized areas of teaching and research in which cooperative arrangements may be desirable and (3) initiating cooperative activities in instruction and research, particularly in graduate areas, among the universities.

After the Committee was established, it requested and was awarded a grant from the Carnegie Corporation of New York to carry on its work. This grant extends through 1963. Staff offices are located on the campus of Purdue University at Lafayette, Indiana.

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The activities of the Research Center are conducted by a small staff, assisted by consultants drawn from either private architectural and engineering firms experienced in college and university facilities design and planning, or from university faculties and staff.

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